FTPI WORKSHOP SUMMARY: "SYMMETRIES AND INTERACTIONS IN TOPOLOGICAL MATTER" MAY 1-3, 2015

ORGANIZERS: Alex Kamenev and Fiona Burnell

This year's Fine institute condensed matter workshop Symmetries and Interactions in Topological Matter focused on recent developments in understanding the role of, and interplay between, symmetry and topology in novel quantum materials. The program consisted of 24 invited talks, as well as a poster session featuring 30 posters, mostly contributed by the many graduate students and post-doctoral researchers in attendance.

Topological quantum matter is arguably the most active topic in modern condensed matter physics. It was born out of recent understanding that the certain classes of materials support robust propagating electronic edge states, which may be traced back to the topological properties of the electronic spectra. Besides the fundamental importance, these realizations offer a number of practical applications. The latter range from thermoelectric devices to topological quantum computations, essentially free from decoherence effects.

The talks covered a range of topics representing many of the currently most active research foci in this subject area. Experimental talks covered recently discovered Weyl semimetals, new types of 2D topological insulators, and 1D topological superconducting wires. Theory talks focused principally on symmetry protected topological (SPT) phases of matter, from topological crystalline insulators to spin liquids and other strongly interacting SPT's. A number of speakers also addressed the role of disorder for these systems. This cross-section of topics brought together experimental and theoretical communities working in closely related areas, which have otherwise had surprisingly little opportunity to interact at workshops of this type. We felt that it made our program unique and particularly beneficial to the research community.

By all accounts the workshop was a resounding success. First, the speaker list was excellent, as evidenced by the fact that workshop was extremely well attended. There were 122 registered participants in total, which is about factor of two larger than our typical workshop of the same format. Second, the audience was lively and most talks were followed by insightful questions and discussion, which enriched the intellectual content of the program significantly. Finally, a number of participants commented on

the very high quality of the contributed posters, which kept a significant number of participants at the poster session until close to its conclusion in spite of a long day of talks beforehand. For all of these reasons, we feel that the program was a very positive contribution both to research in this particular field and to the physics department at UMN.

Summary by Alex Kamenev

Workshop website:
http://www.ftpi.umn.edu/workshops/2014-2015/Symmetries2015/index.html